Assignment - 1

Prajwaldeep Kamble

***Abstract*—This document contains the solution to Exercise 3.41 (a) of Oppenheim.**

Problem 1. In the figure P3.41-1, h[n] is the impulse response of the LTI system within the inner box. The input to system $h[n]$ is $v[n]$, and the output is $w[n]$. The z-transform of $h[n]$, $H(z)$ exists in the following region of convergence.

$$0 < r_{min} < |z| < r_{max} < \infty \tag{1}$$

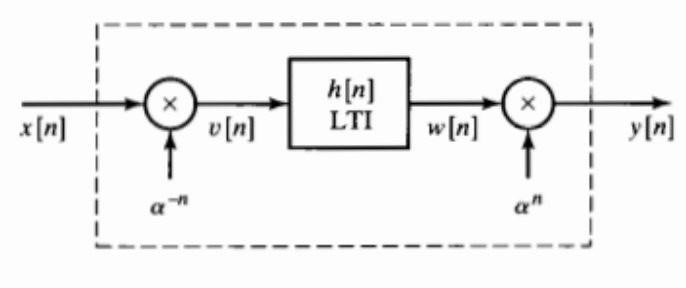

Fig. 1: Figure P3.41-1

Solution: Yes, $h[n]$ will be BIBO stable if it's ROC includes the unit cicle.

$\therefore$ if $r_{min} < 1$ and $r_{max} > 1$, then LTI system is BIBO stable.